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PSYCHOLOGICAL REALITY OF THE PARAGRAPH

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Experiments were carried out to determine (1) the degree of agreement with which subjects identify paragraph boundaries in unindented prose passages, (2) if a significant proportion of cues to paragraph structure are formal in nature, (3) if the identification of paragraphs in different kinds of prose differentially depends on semantic (as distinct from formal) cues, and (4) to study developmental changes in paragraphing ability. Nouns, verbs, adjectives and adverbs in ten English prose passages were replaced by nonsense paralogs. The subjects identified paragraph boundaries in both English and nonsense versions. The median reliability for paragraphing English passages was .86; for nonsense, .75. The median correlation between paragraphing of English and nonsense versions of the same passage was .71. In the light of inter-judge reliabilities, it seems clear that the paragraph is a psychological unit. It also seems possible to infer for each passage the relative saliency of the classes of semantic and formal cues, the nature of their interaction, and the univocality of each class. It is suggested that a paragraph is a unit composed of many "structural constituents," each constituent consisting of a string dominated by a common marker--sentence subject (lexical system), verb tense (grammatical system), or generalized statement of a topic (rhetorical system). See ED 016 961 and ED 016 976. (Author/AMM)

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# PSYCHOLOGICAL REALITY OF THE PARAGRAPH[1]

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3 experiments were carried out (a) to assess the degree of agreement with which subjects identify paragraph boundaries in unindented prose passages, (b) to determine whether a significant proportion of cues to paragraph structure are formal in nature, (c) to ascertain whether the identification of paragraphs in different kinds of prose differentially depends on semantic, as distinct from formal, cues, and (d) to study developmental changes in paragraphing ability. Nouns, verbs, adjectives, and adverbs in 10 English prose passages were replaced by nonsense paralogs and subjects identified paragraph boundaries in both English and nonsense versions. The median reliability for paragraphing English passages was .86; for nonsense, .75. The median correlation between paragraphing of English and nonsense versions of the same passage was .71. Children approach adult levels of paragraphing more quickly with nonsense passages than with English. A conceptual model of paragraph structure was suggested.

Several recent experiments have dealt with the psychological implications of phrase structures within the sentence (e.g., Fodor & Bever, 1965; Johnson, 1965) and of the base structure of the whole sentence (e.g., Mehler & Carey, 1967). To date, however, the problems of paragraph structure have not been systematically studied by psychologists. This paper is an attempt to open up this potentially rich area by reporting a series of preliminary experiments designed to explore the general nature of paragraph structures and to suggest a theoretical scheme that may lead to their explication.

It seems apparent that in ordinary linguistic communication we respond to larger meaningful units than the sentence. We may ask, then, whether the paragraph is a psychologically real structure. If so, it may represent a conventional (learned) way of chunking large amounts of information, and subjects should then agree in identifying its boundaries. Furthermore, if it is the case that a grasp of the underlying structure of a sentence contributes to its understanding, it seems reasonable to ask whether the perception of a paragraph's structure may perform a similar service. At this point, there seems to be a curious divergence in thinking addressed to the problems of sentence structure

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and that directed to the kinds of organization that are commonly assumed to exist for paragraphs. The former are seen as possessing formal characteristics that are independent of meaning while the latter are most often viewed as basically semantic units determined by arbitrary and idiosyncratic decisions. However, there seems to be no a priori reason to expect an abrupt shift away from formal cues on the part of language users to a heavy dependence on semantic connections when we pass beyond the sentence boundary. This proposition may be tested by changing the content words in a prose passage to nonsense paralogs, and having subjects mark paragraph boundaries in both English and nonsense versions. The correlation between the number of paragraph markers placed at the common sentence junctures in the two versions should provide an indication of the role of semantic cues.

It is entirely possible that paragraph structures in different kinds of literary prose (i.e., exposition, narration, description, dialogue, etc.) depend in different degrees on formal, as distinct from semantic, cues. In addition, these different prose "modes" may vary in the clarity and discriminability of their paragraph structures. Therefore, an investigation of paragraph structure should sample each of the commonly accepted modes.

Finally, a study of developmental changes in the ability to identify paragraph structures should indicate the degree to which discrimination of formal and semantic cues proceeds in parallel fashion or, alternatively, the tendency for one or the other to control such identifications at different stages of linguistic development. It is possible that the less extensive and less well organized vocabulary of children may result in less sensitivity to semantic cues than that exhibited by adults. Perhaps children learn paragraph structure inductively (i.e., without formal tuition) as they appear to learn sentence structure. To what extent, then, can children who can read, but who have received no formal instruction in paragraphing, still identify paragraph boundaries?

## Method

Three experiments were conducted. Features common to them all are reported first, followed by mention of the conditions unique to each.

Subjects. In Experiments 1 and 2, the subjects were college undergraduates who were native speakers of English. Approximately 50% of them were male, although subjects' sex was disregarded in data collection and analysis. In Experiment 3, subjects were students in elementary, junior, and senior high school.

Materials. A total of 11 passages of English prose served as the original set of stimuli. The number of sentences per passage ranged from 15 to 52; the number of words, from 216 to 592. Each passage was printed on a separate page with brackets [ ] placed between sentences and at the beginning and end of the passage. Passages 1 to 10 were also converted to nonsense by replacing all nouns, verbs, adjectives, and adverbs with nonsense paralogs of equal average syllabic length. For example, the sentence "Sloths have no right to be living on the earth today; they would be fitting inhabitants of Mars, where a year is over six hundred days long" becomes "Smars have no mirt to be lewling on the kust reteb; they would be tibbing nonentants of Ness, where a reet is over nus cantron tels dan." Word endings that play a grammatical role (e.g., -ed, -ly, -s, -ing) were retained, as were all sentence punctuation marks, including commas, semicolons, periods, and quotation marks. All paragraph indentions were removed. In the nonsense version, a given paralog replaced one and only one English word, and was repeated at every occurrence of the latter. According to the classification system suggested by Rockas (1964), Passages 1 through 4 are examples of exposition, 5 is description; 6, narration; 7, drama; 8, reverie; 9, dialogue; 10, persuasion; and 11, narration.[2] Seven of the 11 passages did not begin or end with paragraph boundaries, as they were originally written.

Procedure. Each subject responded to one English and one nonsense passage; no subject responded to the same passage in both English and nonsense versions. One-half paragraphed a nonsense passage first; one-half, an English passage first. Passages were randomly assigned to subjects; the number of subjects responding to each passage ranged from 9 to 32. Data were collected in group sessions, with the number of subjects in each session ranging from 6 to 25.

Each experimental session was conducted as a sequence of tasks, with each subject working at his own pace, and with successive tasks given him only upon completion of the preceding one. Subjects were given an English (nonsense) passage and a page of printed instructions which: (a) explained that the purpose of the experiment was to find out "how and why we use paragraphs"; (b) asked him to read the passage carefully and to place paragraph markers "at the places that seem right to you" without regard to where the author may have put them; (c) pointed out that each passage "may or may not begin and end with a paragraph"; (d) pointed out that there was another task to be performed; and (e) requested that he raise his hand when he finished the current one. The instructions were also read aloud, and questions answered by rephrasing the instructions. When a

subject completed his first passage, he was given the second, with an additional instruction page which explained that he was to perform the same task on different material.

Experiment 1

Each of the passages numbered 1 to 4 were paragraphed by 9 to 14 college undergraduates, in both English and nonsense versions.

Experiment 2

Each of the English and nonsense passages 5 to 10 were paragraphed by 10 to 12 college undergraduates. Passage 11 (English only) was paragraphed by 32 subjects.

Experiment 3

Subjects. Subjects were elementary, junior high, and high school students; data were collected in their classrooms. There were three groups, consisting of 12 7- to 8-year-olds, 10 subjects from 10 to 12 years, and 13 from 14 to 16 years. The sexes were approximately equally balanced within each age group.

Materials. Passages 2 (nonsense) and 11 (English) were used as stimuli.

Procedure. All subjects responded to both passages.

Results and Discussion

It was possible that the order of presentation of the stimuli (i.e., English-nonsense versus nonsense-English) could produce differences in paragraphing responses. Chi square was used to compare the distributions of paragraph markers, and of the total number of markers associated with the two orders in Experiment 1; there were no significant differences. Therefore, this variable was ignored in subsequent analyses.

Experiments 1 and 2

Inter-judge consistency in marking paragraphs in both experiments was quite high. Table 1 presents the combined results for both English (E) and nonsense (N)

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Insert Table 1 about here

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passages. It is to be noted that the subjects' paragraphing is not compared with the author's, but is reported only in terms of inter-judge reliability. It can be seen, for example, that 14 of the 19 sentence junctures in passage 5E were seen as constituting paragraph boundaries by 20% or fewer of the subjects, while 3 of

the 19 were thought to mark paragraph boundaries by more than 80%. In other words, for 17 of the 19 sentence junctures in the passage, 80% or more of the subjects agreed in their judgments regarding paragraph boundaries.

Kuder-Richardson Formula 20 (Guilford, 1954) was used to obtain a single statement of inter-judge agreement for each passage. These figures are given in the last column in Table 1. The $r_{tt}$ obtained with this formula for passage 5 is .96. This use of K-R 20 differs from the conventional in that the figures express the consistency between subjects rather than between items (i.e., sentence junctures). It thus provides a measure of the diffuseness of paragraphing behavior, and may be interpreted as reflecting the ambiguity or equivocality of the "paragraphing signals" occurring in the passages.

In every case but one (passage 3) inter-judge agreement, in terms of K-R reliability, is greater for English than for nonsense versions of the same passage, the differential ranging from -.01 to .25. This difference is significant at the .02 level (Mann Whitney U = 22,2 tails). This result may be taken to indicate the contribution to the identification of paragraph structures made by subjects' knowledge of the meanings of the content words in the passage.

Even in the nonsense passages, however, reliability ranges from .69 to .92, with one exception. These findings indicate that the paragraph is a psychologically real unit, and that this unit may not be predominantly semantic in character. This inference is supported by Pearson product-moment correlations between E and N versions of the same passage, as shown in Table 2. These figures represent the correspondence between the proportions of subjects placing paragraph markers at common sentence junctures in the two versions.

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Insert Table 2 about here

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For comparison's sake, it is interesting to note the reliability with which subjects can mark sentences--more rigorously defined and more highly overlearned structures. Both E and N versions of passages 1 and 3 were changed by removing all conventional punctuation (capital letters, periods, commas, semicolons, etc.) and equalizing all between-word spaces. The unindented passages were each presented to 12 college undergraduates with instructions to mark the sentences as they saw them. For passages 1E and 1N, K-R reliabilities are .99 and .90 respectively; for 3E and 3N, .97 and .96. This compares with a median paragraphing reliability for all 11 English passages of .86 and of the 10 nonsense passages

of .75. It appears that the effect of changing content words to paralogs is remarkably similar, whether one is attempting to identify sentences or paragraphs.

Further analysis of the patterns of these correlations and of the relative reliabilities of paragraphing corresponding English and nonsense passages yields information on (a) the relations between semantic and formal cues in controlling subjects' paragraphing behavior in the various passages, and (b) the relative saliency and univocality of each kind of cue. Table 3 presents the various patterns of these measures that occurred among the stimulus passages used.

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Insert Table 3 about here

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Case 1 (the pattern marked by high reliability in E paragraphing, a relatively large drop in reliability for the corresponding N passage, and a high E-N correlation) may be interpreted to mean that semantic and formal cues interact to reinforce and supplement each other. That is, it appears to be their joint effect that elicits the relatively high degree of inter-judge consistency seen in passage 1E. Case 2 (passages 2, 5, and 6) replicates the pattern of Case 1, except for a low E-N correlation, leading to the observation that semantic cues appear to be dominant and univocal as a group, while formal cues are recessive and ambiguous. In Case 3 (passages 3, 7, and 9) semantic and formal cues appear to be redundant, and either class is sufficiently clear to control paragraphing behavior.

The pattern exhibited by Case 4 could be interpreted as indicating that dominant, univocal formal cues control paragraphing, but that the locations of these signals do not coincide with those of the semantic cues. None of the stimulus passages had this pattern, though it seems a possible one. The same is true of Case 5, a pattern which is statistically improbable, calling as it does for a high correlation between two distributions, both of which exhibit low reliabilities. Had it occurred, it might be interpreted to mean that both semantic and formal cues were ambiguous, but that their interaction operated to reduce the effect of the class ambiguities and to improve paragraphing consistency.

In Case 6 (passage 10) semantic and formal cues appear to be redundant and additive, somewhat in the manner of Case 3, except that here both are ambiguous and equivocal in effect. Subjects responding to passage 4 (Case 7) appeared to respond more readily to formal cues, but these cues themselves were ambiguous,

resulting in low reliability. It may be inferred that in this passage the semantic cues to paragraphing are very weak indeed. In Case 8 (passage 8) also, subjects appear to respond more readily to ambiguous formal cues, but here their locations tend not to coincide with those of the semantic cues.

It may be concluded that both semantic and formal markers contribute to the perception of paragraph structure, but that the relationship between the two classes of cues is not a simple one, nor is the constituency of either class. For example, the retention of quotation marks in the "dramatic" passage (7) probably contributed to its high reliabilities and E-N correlation; however, one of the expository passages (3), which had no such obvious markers, shows a very similar pattern.

It is entirely possible that paragraph structures may differ from one "mode" of prose to another insofar as their essential features are predominantly semantic, rather than formal, in nature. It would appear from these reliabilities and E-N correlations that almost any pattern of relationship between the two classes of cues may occur in any of the tested modes, and that differences within the expository mode approximate those between pairs of modes. We may conclude that the results of future studies with representative samples of expository passages may be appropriately generalized to all kinds of prose.

Experiment 3

This experiment was designed to study the course of the development of the discriminations required to identify paragraph structures. Because even the English passages used in Experiments 1 and 2 would have been difficult for 7- to 8-year-olds to understand, a simple narrative passage taken from a popular magazine provided the single set of English material that was paragraphed by all subjects. Passage 2N was shortened by several sentences (and re-designated 2Ns) and was also used for all subjects. It can be seen in Table 4 that there

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Insert Table 4 about here

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is a regular increase in inter-judge consistency as a function of increasing age and educational experience, the single reversal being between age groups 10 to 12 and 14 to 16 on passage 2Ns. The fact that a significant proportion of all the paragraph markers of the youngest age group was placed within sentences (43% for 11E; 33% for 2Ns) indicates clearly that the concept "paragraph" was not meaningful to them. Inquiry addressed to the school they attended elicited the

information that the first formal tuition in paragraphing occurs in the third grade--the grade in which these children were enrolled. The degree to which the identification of paragraph structures is dependent on direct teaching, as distinct from the inductive learning that may accompany increased reading skills, cannot be determined from these data, since the two are completely confounded. At any rate, it is clear that, though the child may know what a sentence is when he enters school, he almost certainly does not know what a paragraph is.

The degree to which children in each of three-age brackets agreed with college students in placing paragraph markers at the same sentence junctures may be seen in Table 5. The product-moment correlations increase regularly for both E and N passages. One point appears to be especially worthy of note.

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Insert Table 5 about here

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The increase in the correlations from the youngest to the oldest age group is more than twice as great for the English passage as for the nonsense (105 points as opposed to 52). These data are compatible with the idea that the development of the syntactic system precedes that of the semantic--at least up to a certain point. That point seems to be around 12 years of age, because up to that time, the corrected correlations between college subjects and the two younger groups of children are considerably greater for nonsense material than for English. With the 14 to 16 group, however, the corrected correlations with college subjects' paragraphing are virtually identical in the two passages. Thus we may say that the progress in the processing of formal cues is fairly regular and apparently consists of increasingly finer discriminations of the cues used by adults. In the semantic realm, however, it may be a different story. A fairly massive restructuring of the child's system of semantic cues appears to take place between the ages of 8 and 14. The child must inhibit his earlier responses to whole patterns of cues which adults see as irrelevant and learn to respond to others in order for the corrected correlations to change from -.42 to .85 for passage 11E. It would appear that the message perceived in a passage of connected discourse by children below the age of 12 may be functionally quite different from that to which an adult responds.

Summary and A Theoretical Model

In the light of the inter-judge reliabilities, it seems clear that the paragraph is a psychological unit. That this unit often depends for its identification to a significant extent on formal as well as semantic cues is strongly suggested by a median correlation of .71 between the proportion of subjects marking paragraphs at common sentence junctures in corresponding E and N passages. Furthermore, it has been shown that it is possible to infer for each passage the relative saliency of the classes of semantic and formal cues, the nature of their interaction and the univocality of each class. It seems appropriate at this point to outline a conceptual scheme that may constitute a first step toward a theory of paragraph structure.

Becker (1965; 1966) has suggested that the full explication of paragraphs is a multi-dimensional task. He postulated three interlocking, simultaneously operating "systems" in extended written discourse, which he has labelled lexical, grammatical, and rhetorical. Furthermore, paragraphs as linguistic structures are not necessarily composed of sentences as such, but of other structural elements, some of which may be smaller and some larger than the sentence.

The lexical system, largely semantic in nature, consists of overlapping "lexical equivalence chains" which may, and often do, extend over several sentences. A chain is a series of words or phrases occurring in a sequence of phrases, clauses or sentences and which refer to the same domain of content. In doing so, "equivalence" is maintained through word repetition, synonymity, metaphor, paraphrasing, relative and personal pronouns. For example, in the first two sentences of this paragraph, the words "chains" and "chain" themselves constitute such a chain.

Patterns of formal markers constitute the grammatical system. These include the singularity or plurality of subjects and predicates, the tenses of verbs, and the presence and kind of modal auxiliaries. These structural elements, depending heavily on word endings and function words as signalling devices, often extend over several sentences. The shift from predominantly singular sentence subjects in the preceding paragraph to plural subjects in this one represents a paragraphing cue in the grammatical system. It is recognized, of course, that some new lexical chains begin in this paragraph, while others (e.g., "system") are continued from the preceding two paragraphs.

The rhetorical system consists of patterns or sequences of functional slots, each of which may be filled by one or more sentences. Two patterns of slots that seem to appear often in expository prose are those designated T(topic)-R (restriction)-I(illustration) and P(problem)--S(solution). These slots are the formal elements, the product of whose interaction is the paragraph, in much the same way that relationships between subject, verb, and object specify the sentence. For example, in this paragraph, the first sentence is a Topic element, the second and third together, a Restriction element. The immediately preceding sentence is, of course, an Illustration element. The rhetorical system is, in a sense, a product of the operation of the other two, thus combining semantic and formal properties. Formal markers include cue words and phrases such as for example, in other words, furthermore, however, then, but, and finally. The semantic markers of the lexical equivalence chains also often supply corroborative information indicating the beginning and end of rhetorical structures. Furthermore, the subject(s) of the sentence(s) constituting a Topic element are usually superordinate to the subjects of sentences in an associated Illustration element.

It is suggested that a paragraph is a unit composed of many "structural constituents" of the kinds described, each constituent consisting of a string dominated by a common marker, be it sentence subject (lexical system), verb tense (grammatical system), or generalized statement of a topic (rhetorical system). Within and between the three systems, constituents can, and do, vary quite independently of each other. If these constituents are relevant to the paragraphing behavior of subjects, the more of them that end at a common sentence juncture, the greater should be the probability that subjects will place paragraph markers at that juncture. The utility of this conceptual scheme depends, of course, on the degree to which independent judges who are familiar with the model can agree in identifying these structural elements. If this is achieved, systematic manipulation of the cues associated with each system will allow more precise statements of the nature of the cues controlling paragraphing behavior.

## References

Becker, A. L. A tagmemic approach to paragraph analysis. College Composition and Communication, 1965, 16, 237-242.

Becker, A. L. Symposium on the paragraph. College Composition and Communication, 1966, 17, 67-72.

Fodor, J. A., & Bever, T. G. The psychological reality of linguistic segments. Journal of Verbal Learning and Verbal Behavior, 1965, 4, 414-420.

Guilford, J. P. Psychometric methods. New York: McGraw-Hill, 1954.

Johnson, N. F. The psychological reality of phrase-structure rules. Journal of Verbal Learning and Verbal Behavior, 1965, 4, 469-475.

Mehler, J., & Carey, P. Role of surface and base structure in the perception of sentences. Journal of Verbal Learning and Verbal Behavior, 1967, 6, 335-338.

Rockas, L. Modes of rhetoric. New York: St. Martin's Press, 1964.

## Footnotes

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[2]The stimulus passages were as follows:

1. Beebe, W. The jungle sluggard. In Douglas S. Mead (Ed.), Great English and American essays. New York: Rinehart, 1957. Pp. 138-140.
   Begins "Sloths have no right..." and ends "...eighteen teeth of a sloth?"
2. Boulding, K. E. The image. Ann Arbor: University of Michigan Press, 1956. Pp. 4-5.
   Begins "Looking still further..." and ends "...good word for this."
3. Hall, E. T. The silent language. Greenwich, Conn.: Fawcett, 1959. Pp. 96-97.
   Begins "Most of what is known..." and ends "...otherwise have been possible."
4. Durrell, G. The new Noah. Baltimore: Penguin, 1962. Pp. 28-30.
   Begins "When, as a result..." and ends "... and on the tail."
5. Schiltz, Carol. I sit on the beach.... In Leo Rockas (Ed.), Modes of rhetoric. New York: St. Martin's Press, 1964. Pp. 50-51.
   Begins "There is no ceiling..." and ends "...deserted at night."
6. Gearheart, B. John was sitting... In Leo Rockas (Ed.), Op. cit. Pp. 105-106.
   Begins "He didn't believe Ellen..." and ends "...John to look too."
7. Hemingway, E. "The marvellous thing..." In Leo Rockas (Ed.), Op. cit. Pp. 160-161.
   Begins "Today's the first time..." and ends "...chair beside his cot."
8. Flaherty, R. Damn landlady... In Leo Rockas (Ed.), Op. cit. Pp. 215-216.
   Begins "Damn landlady..." and ends "...bastard like her again."
9. Clark, W. Van T. The ox-bow incident. New York: New American Library, 1963. Pp. 46-47.
   Begins "It made Winder wild..." and ends "...worse than a murderer's."
10. McCormick, Carole. "Why would you want..." In Leo Rockas (Ed.), Op. cit. Pp. 241-242.
    Begins "A person who fears..." and ends "...no other choice."
11. Now they are three. Saturday Evening Post, September 24, 1966, 34.
    Begins "At about 6 a.m..." and ends "...tired parents at about 9:15."

Table 1

Inter-Judge Consistency in Paragraphing

| Passage | No. Junctures | Percentage of Ss Marking Paragraph | | | | | (K-R 20) $r_{tt}$ |
|---|---|---|---|---|---|---|---|
| | | 0-20 | 21-40 | 41-60 | 61-80 | 81-100 | |
| 1E | 14 | 9[a] | 0 | 2 | 2 | 1 | .86 |
| 1N | 14 | 8 | 1 | 5 | 0 | 0 | .69 |
| 2E | 32 | 27 | 1 | 0 | 1 | 3 | .98 |
| 2N | 32 | 19 | 7 | 5 | 1 | 0 | .73 |
| 3E | 22 | 14 | 1 | 4 | 2 | 1 | .86 |
| 3N | 22 | 15 | 2 | 4 | 1 | 0 | .87 |
| 4E | 17 | 10 | 3 | 2 | 2 | 0 | .80 |
| 4N | 17 | 11 | 0 | 5 | 1 | 0 | .79 |
| 5E | 19 | 14 | 1 | 1 | 0 | 3 | .96 |
| 5N | 19 | 10 | 6 | 2 | 1 | 0 | .73 |
| 6E | 25 | 20 | 2 | 1 | 1 | 1 | .86 |
| 6N | 25 | 18 | 1 | 5 | 0 | 1 | .76 |
| 7E | 53 | 27 | 2 | 2 | 5 | 17 | .95 |
| 7N | 53 | 28 | 2 | 2 | 10 | 11 | .92 |
| 8E | 22 | 10 | 3 | 2 | 7 | 0 | .79 |
| 8N | 22 | 11 | 3 | 6 | 1 | 1 | .74 |
| 9E | 52 | 22 | 3 | 4 | 9 | 14 | .91 |
| 9N | 52 | 12 | 11 | 9 | 7 | 13 | .89 |
| 10E | 25 | 18 | 4 | 2 | 1 | 0 | .75 |
| 10N | 25 | 17 | 5 | 3 | 0 | 0 | .53 |
| 11E | 14 | 8 | 4 | 0 | 1 | 1 | .94 |

[a]Figure in each cell represents the number of sentence junctures in the passage at which a given percentage-range (e.g., 0-20, 21-40) of subjects marked paragraphs.

Table 2

Correlations Between Proportions of Subjects Marking Paragraphs at Common Sentence Junctures in Corresponding English and Nonsense Passages

| Passages[a] | Pearson r[b] |
|---|---|
| 1E - 1N | .91** |
| 2E - 2N | .63** |
| 3E - 3N | .93** |
| 4E - 4N | .78** |
| 5E - 5N | .42 |
| 6E - 6N | .53** |
| 7E - 7N | .95** |
| 8E - 8N | .47* |
| 9E - 9N | .84** |
| 10E - 10N | .45* |

*p < .05

**p < .01

[a]Passage 11E was not transformed to nonsense

[b]Median correlation = .71

Table 3

Patterns of Reliabilities and English-Nonsense Correlations in the Paragraphing of Corresponding Passages

| $(E)r_{tt} \geq .86$[a,b] | | | | $(E)r_{tt} < .86$ | | | |
|---|---|---|---|---|---|---|---|
| $(E)r_{tt} - (N)r_{tt} > .075$[c,d] | | $(E)r_{tt} - (N)r_{tt} < .075$ | | $(E)r_{tt} - (N)r_{tt} > .075$ | | $(E)r_{tt} - (N)r_{tt} < .075$ | |
| $r_{EN} > .71$[e,f] | $r_{EN} < .71$ | $r_{EN} > .71$ | $r_{EN} < .71$ | $r_{EN} > .71$ | $r_{EN} < .71$ | $r_{EN} > .71$ | $r_{EN} < .71$ |
| Passage 1 | Passages 2, 5, 6 | Passages 3, 7, 9 | None | None | Passage 10 | Passage 4 | Passage 8 |
| Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 | Case 8 |

[a] Reliability ($r_{tt}$) of paragraphing English passage, using Kuder-Richardson Formula 20.

[b] Median $(E)r_{tt} = .86$.

[c] Reliability of paragraphing nonsense passage.

[d] Median $\left[(E)r_{tt} - (N)r_{tt}\right] = .075$

[e] Pearson product-moment correlation between paragraphing of corresponding English and nonsense passage.

[f] Median $r_{EN} = .71$.

Table 4

Developmental Changes in Inter-Judge Consistency in Paragraphing

| Passage and No. Junctures | Age Level | Percentage of Ss Marking Paragraph 0-20 | 21-40 | 41-60 | 61-80 | 81-100 | (K-R 20) $r_{tt}$ |
|---|---|---|---|---|---|---|---|
| 2 Ns | 7-8[a] | 11[c] | 12 | 5 | 0 | 0 | .29 |
| (28 junctures) | (n=12) | | | | | | |
| | 10-12 | 17 | 8 | 2 | 1 | 0 | .69 |
| | (n=10) | | | | | | |
| | 14-16 | 19 | 7 | 2 | 0 | 0 | .59 |
| | (n=12) | | | | | | |
| | Adult | 21 | 2 | 4 | 1 | 0 | .83 |
| | (n=11) | | | | | | |
| 11E | 7-8[b] | 2 | 9 | 2 | 1 | 0 | .41 |
| (14 junctures) | (n=12) | | | | | | |
| | 10-12 | 5 | 8 | 1 | 0 | 0 | .55 |
| | (n=10) | | | | | | |
| | 14-16 | 9 | 1 | 2 | 0 | 2 | .92 |
| | (n=12) | | | | | | |
| | Adult | 8 | 4 | 0 | 1 | 1 | .94 |
| | (n=32) | | | | | | |

[a]33% of all paragraph markers were placed within sentences.

[b]43% of all paragraph markers were placed within sentences.

[c]Figure in each cell represents the number of sentence junctures in the passage at which a given percentage range (e.g., 0-20, 21-40) of subjects marked paragraphs.

Table 5

Correlations Between Placement of Paragraph Markers by Adults and Children of Three-Age Levels

| Age Group | Passage 11E Uncorrected[a] | 11E Corrected for Attenuation | Passage 2Ns Uncorrected[b] | 2Ns Corrected for Attenuation |
|---|---|---|---|---|
| 7-8 | -.26 | -.42 | .05 | .10 |
| 10-12 | .23 | .32 | .31 | .54 |
| 14-16 | .79 | .85 | .57 | .81 |

[a]Correlations ≥ .66 significant at .01 level.

[b]Correlations ≥ .48 significant at .01 level.